IN THE CLAIMS:

Please cancel Claims 2 and 3 without prejudice to or disclaimer of the subject matter presented therein.

Please amend Claims 1, 6-11, 13, and 14, and add new Claims 15-21 as follows.

1. (Currently Amended) An image processing apparatus for embedding predetermined information in image data, comprising:

generation means for generating a binary mask pattern having an M x N size, which has said mask pattern itself having a blue noise characteristic and specifies each bit in the mask pattern indicating either a target embedding position or a non-target embedding position represented by binary information in an M x N size; and

embedding means for applying the mask pattern to part of the image data and modulating image data corresponding to the target embedding position to embed the predetermined information,

wherein said embedding means does not modulate image data corresponding to the non-target embedding position.

2. (Cancelled)

3. (Cancelled)

4. (Original) The apparatus according to claim 1, wherein the modulation is performed by quantizing the image data corresponding to the target embedding position.

3. (Original) The apparatus according to claim 1, wherein said embedding means repeatedly applies the mask pattern to a portion other than the part of the image data and modulates the image data corresponding to the target embedding portion to embed the predetermined information.

4. (Currently Amended) An image processing method of embedding predetermined information in image data, comprising:

the generation step of generating a binary mask pattern having an M x N size, which has said mask pattern itself having a blue noise characteristic and specifies each bit in the mask pattern indicating either a target embedding position or a non-target embedding position represented by binary information in an M x N size; and

the embedding step of applying the mask pattern to part of the image data and modulating image data corresponding to the target embedding position to embed the predetermined information,

wherein said embedding step does not modulate image data corresponding to the non-target embedding position.

5. (Currently Amended) A computer-readable storage medium which stores an image processing program for embedding predetermined information in image data, the program comprising:

the generation step of generating a binary mask pattern having an M x N size, which has said mask pattern itself having a blue noise characteristic and specifies each bit

in the mask pattern indicating either a target embedding position or a non-target embedding position represented by binary information in an M x N size; and

the embedding step of applying the mask pattern to part of the image data an modulating image data corresponding to the target embedding position to embed the predetermined information,

wherein said embedding step does not modulate image data corresponding to the non-target embedding position.

8. (Currently Amended) An image processing apparatus for extracting predetermined information from image data in which the information has been embedded, comprising:

generation means for generating a binary mask pattern having an M x N size, which has said mask pattern itself having a blue noise characteristic and specifies each bit in the mask pattern indicating either a target embedding position or a non-target embedding position represented by binary information in an M x N size; and

extraction means for applying the mask pattern to part of the image data and detecting a modulated state of image data corresponding to the target embedding position to extract the predetermined information,

wherein said extraction means does not detect the modulated state of image data corresponding to the non-target embedding position.

9. (Currently Amended) An image processing method of extracting predetermined information from image data in which the information has been embedded, comprising:

the generation step of generating a <u>binary</u> mask pattern <u>having an M x N size,</u> ~~which has~~ <u>said mask pattern itself having</u> a blue noise characteristic and ~~specifies~~ <u>each bit</u> <u>in the mask pattern indicating either</u> a target embedding position <u>or a non-target embedding</u> <u>position represented by binary information</u> ~~in an M x N size;~~ and

the extraction step of applying the mask pattern to part of the image data and detecting a modulated state of image data corresponding to the target embedding position to extract the predetermined information<u>,</u>

<u>wherein said extraction step does not detect the modulated state of image data</u> <u>corresponding to the non-target embedding position.</u>

10. (Currently Amended) A computer-readable storage medium which stores an image processing program for extracting predetermined information from image data in which the information has been embedded, the program comprising:

the generation step of generating a <u>binary</u> mask pattern <u>having an M x N size,</u> ~~which has~~ <u>said mask pattern itself having</u> a blue noise characteristic and ~~specifies~~ <u>each bit</u> <u>in the mask pattern indicating either</u> a target embedding position <u>or a non-target embedding</u> <u>position represented by binary information</u> ~~in an M x N size;~~ and

the extraction step of applying the mask pattern to part of the image data and detecting a modulated state of image data corresponding to the target embedding position to extract the predetermined information<u>,</u>

wherein said extraction step does not detect the modulated state of image data corresponding to the non-target embedding position.

9.

11. (Currently Amended) An image processing apparatus comprising:

~~generation means for binarizing each coefficient of a mask and generating a two-dimensional mask having periodical or pseudo-periodical peaks on a radial frequency domain of resultant binary information;~~

first input means for inputting image data;

second input means for inputting additional information;

means for making each coefficient of ~~the~~ a two-dimensional mask correspond to ~~each~~ respective bit information of the additional information, each coefficient being represented in multilevel to identify a priority for embedding the bit information of the additional information; and

digital watermark embedding means for ~~adding/subtracting~~ modulating the image data, in accordance with the coefficients of the mask, on the basis of a positional relationship obtained by assigning the two-dimensional mask onto the image data as a correspondence result, thereby embedding ~~each~~ the bit information in the image data,

wherein the mask has periodic or pseudo-periodic peaks on a radial frequency domain of resultant binary information in a case where each coefficient of the two-dimensional mask is binarized.

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12. (Original) The apparatus according to claim 11, wherein said digital watermark embedding means adds/subtracts a value of a pixel of the image data in

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accordance with contents of each bit information to embed each bit information in the image data.

13. (Currently Amended) An image processing method comprising:

~~the generation step of binarizing each coefficient of a mask and generating a two-dimensional mask having periodical or pseudo-periodical peaks on a radial frequency domain of resultant binary information;~~

a ~~the~~ first input step of inputting image data;

a ~~the~~ second input step of inputting additional information;

a ~~the~~ step of making each coefficient of ~~the~~ a two-dimensional mask correspond to ~~each~~ respective bit information of the additional information; and

a ~~the~~ digital watermark embedding step of ~~adding/subtracting~~ modulating the image data, in accordance with the coefficients of the mask, on the basis of a positional relationship obtained by assigning the two-dimensional mask onto the image data as a correspondence result, thereby embedding ~~each~~ the bit information in the image data,

wherein the mask has periodic or pseudo-periodic peaks on a radial frequency domain of resultant binary information in a case where each coefficient of the two-dimensional mask is binarized.

14. (Currently Amended) A computer-readable storage medium which stores an image processing program comprising:

~~the generation step of binarizing each coefficient of a mask and generating a two-dimensional mask having periodical or pseudo-periodical peaks on a radial frequency domain of resultant binary information;~~

a ~~the~~ first input step of inputting image data;

a ~~the~~ second input step of inputting additional information;

a ~~the~~ step of making each coefficient of the two-dimensional mask correspond to respective ~~each~~ bit information of the additional information; and

a ~~the~~ digital watermark embedding step of ~~adding/subtracting~~ modulating the image data, in accordance with the coefficients of the mask, on the basis of a positional relationship obtained by assigning the two-dimensional mask onto the image data as a correspondence result, thereby embedding ~~each~~ the bit information in the image data,

wherein the mask has periodic or pseudo-periodic peaks on a radial frequency domain of resultant binary information in a case where each coefficient of the two-dimensional mask is binarized.

18. (New) The image processing apparatus according to claim N, further comprising:

scale mark embedding means for embedding a plurality of scale marks at a predetermined area in the image data inputted by said first input means, wherein distance between the scale marks is fixed, and

wherein said digital watermark embedding means embeds the additional information input by said second input means into the image embedded with the scale marks by said scale information embedding means.

16. (New) The image processing apparatus according to claim 15, wherein said scale mark embedding means includes:

Fourier transform means for Fourier transforming a predetermined area in the image data inputted by said first input means to obtain amplitude spectrum data and phase spectrum data from the area;

impulse signal adding means for adding a plurality of impulse signals to the amplitude spectrum obtained by said Fourier transform means as the scale marks; and

inverse Fourier transform means for inverse Fourier transforming using the amplitude spectrum processed by said impulse signal adding means and the phase spectrum obtained by said Fourier transform means.

17. (New) An image processing apparatus for extracting predetermined information from image data in which the information has been embedded, comprising:

input means for inputting image data from which embedded information is to be extracted;

mask input means for inputting a two-dimensional mask in which each coefficient corresponds to respective bit information of additional information, each coefficient being represented in multilevel to identify a priority for embedding the bit information of the additional information; and

extraction means for applying the mask pattern to part of the image data, detecting a modulated state of image data in accordance with positions of coefficients in the mask, and extracting the additional information on the basis of the detection results,

wherein the mask has periodic or pseudo-periodic peaks on a radial frequency domain of resultant binary information in a case where each coefficient of the two-dimensional mask is binarized.

18. (New) The image processing apparatus according to claim 17, further comprising:

scale mark detection means for detecting a plurality of scale marks at a predetermined area in the image inputted by said input means; and

scaling means for changing the scale of the image input by said input means,

wherein said extraction means extracts the additional information from image data scaled by said scaling means.

19. (New) The image processing apparatus according to claim 18, wherein said scale mark detection means includes:

Fourier transform means for Fourier transforming a predetermined area in the image data inputted by said input means to obtain amplitude spectrum data from the area; and

detection means for detecting positions of impulse signals in the amplitude spectrum to determine the scale of the image inputted by said input means.

20. (New) An image processing method for extracting predetermined information from image data in which the information has been embedded, comprising:

an input step of inputting image data from which embedded information is to be extracted;

a mask input step of inputting a two-dimensional mask in which each coefficient corresponds to respective bit information of additional information, each coefficient being represented in multilevel to identify a priority for embedding the bit information of the additional information; and

an extraction step of applying the mask pattern to part of the image data, detecting a modulated state of image data in accordance with positions of coefficients in the mask, and extracting the additional information on the basis of the detection results, wherein the mask has periodic or pseudo-periodic peaks on a radial frequency domain of resultant binary information in a case where each coefficient of the two-dimensional mask is binarized.

21. (New) A computer-readable storage medium storing a program for extracting predetermined information from image data in which the information has been embedded, the program comprising:

code for an input step of inputting image data from which embedded information is to be extracted;

code for a mask input step of inputting a two-dimensional mask in which each coefficient corresponds to respective bit information of additional information, each coefficient being represented in multilevel to identify a priority for embedding the bit information of the additional information; and

code for an extraction step of applying the mask pattern to part of the image

data, detecting a modulated state of image data in accordance with positions of coefficients

in the mask, and extracting the additional information on the basis of the detection results,

wherein the mask has periodic or pseudo-periodic peaks on a radial frequency

domain of resultant binary information in a case where each coefficient of the two-

dimensional mask is binarized.